

WHAT IS CLAIMED IS:

1. An electro-optical apparatus, comprising:
a pair of substrates;
an electro-optical material disposed between the pair of substrates;
5 a switching element disposed on one of said substrates; and
a light shielding film disposed at a location opposing said switching element, said light shielding film including:
a metal layer formed of a refractory metal in the form of a simple substance or a refractory metal compound; and
10 a barrier layer disposed on at least one surface of said metal layer, said barrier layer being formed of a refractory metal or a refractory metal compound containing no oxygen.
2. The electro-optical apparatus according to Claim 1, said light shielding film being disposed between said one of the substrates and said switching element,
15 and said barrier layer of said light shielding layer being disposed on a side facing said switching element.
3. The electro-optical apparatus according to Claim 1, said light shielding film being disposed on said switching element such that said light shielding film faces said electro-optical material.
- 20 4. The electro-optical apparatus according to Claim 1, the metal layer of said light shielding film including a light shielding metal layer and a light-absorbable metal layer, and said light-absorbable metal layer being disposed on a side facing said switching element.
5. The electro-optical apparatus according to Claim 1, said metal layer
25 being interposed between said barrier layers.
6. The electro-optical apparatus according to Claim 1, said substrate other than the one substrate including a light shielding film being formed thereon, said light shielding film serving to define a display area and including a metal layer which is formed of a refractory metal in the form of a simple substance or a refractory metal
30 compound, and also including a barrier layer which is formed of a refractory metal in the form of a simple substrate or a refractory metal compound containing no oxygen and which is disposed on at least one of the surfaces of said metal layer.
7. The electro-optical apparatus according to Claim 1, said light shielding film being connected to a fixed potential.

8. The electro-optical apparatus according to Claim 1, said barrier layer being formed of a material selected from the group including a nitride compound, a silicon compound, a tungsten compound, tungsten, and silicon.

5 9. The electro-optical apparatus according to Claim 1, said barrier layer being formed of WSi.

10 10. The electro-optical apparatus according to Claim 9, said metal layer being formed of Ti.

11. The electro-optical apparatus according to Claim 10, said barrier layer being formed on upper and lower surfaces of said metal layer, such that a thickness of the barrier layer formed on the upper surface is greater than a thickness on the lower surface.

12. The electro-optical apparatus according to Claim 11, the thickness of said metal layer being within the range from 30 nm to 50 nm, the thickness of the upper barrier layer being within the range from 30 nm to 100 nm, and the thickness of the lower barrier layer being within the range from 10 nm to 20 nm.

13. An electronic device, comprising:
the electro-optical apparatus according to Claim 1.

14. A substrate for use in an electro-optical apparatus, comprising:
an insulating substrate; and
20 a light shielding film disposed on said insulating substrate, said light shielding film including:

a metal layer formed of a refractory metal in the form of a simple substance or a refractory metal compound; and

25 a barrier layer disposed on at least one surface of said metal layer, said barrier layer being formed of a refractory metal or a refractory metal compound containing no oxygen.

15. A method of manufacturing a substrate for use in an electro-optical apparatus, comprising the steps of:

30 forming a metal layer by depositing a film of a refractory metal in the form of a simple substance or a film of a refractory metal compound on an insulating substrate;

forming a barrier layer by depositing a film of a refractory metal or a refractory metal compound containing no oxygen on said metal layer; and

forming an insulating film by depositing an insulating material on said barrier layer.

16. The method of producing a substrate for use in an electro-optical apparatus according to Claim 15, further comprising the step of forming a barrier layer
5 by depositing a film of a refractory metal or a refractory metal compound containing no oxygen upon said metal layer prior to forming the metal layer.

17. The method of producing a substrate for use in an electro-optical apparatus according to Claim 15, said step of forming the insulating film including performing heat treatment at a temperature in the range from 500°C to 1100°C.

10 18. A light shielding film, comprising:
a metal layer formed of a refractory metal in the form of a simple substance or a refractory metal compound; and
a barrier layer disposed on at least one surface of said metal layer, said barrier layer being formed of a refractory metal or a refractory metal compound
15 containing no oxygen.

19. The light shielding film according to Claim 18, said barrier layer being formed of a material selected from the group including a nitride compound, a silicon compound, a tungsten compound, tungsten, and silicon.

20 20. The light shielding film according to Claim 19, said barrier layer being formed of a nitride compound selected from the group including SiN, TiN, WN, MoN, and CrN.

21. The light shielding film according to Claim 19, said barrier layer being formed of a silicon compound selected from the group including TiSi, WSi, MoSi, CoSi, and CoSi.

25 22. The light shielding film according to Claim 19, said barrier layer being formed of a tungsten compound selected from the group including TiW and MoW.

23. The light shielding film according to Claim 18, said metal layer being formed of a simple substance of metal selected from the group including Ti, W, Mo, Co, Cr, Hf, and Ru.

30 24. The light shielding film according to Claim 18, said metal layer being formed of a metal compound selected from the group including TiN, TiW, and MoW.

25. The light shielding film according to Claim 18, the thickness of said barrier layer being within the range from 1 to 200 nm.

26. The light shielding film according to Claim 18, the thickness of said metal layer being within the range from 10 to 200 nm.

27. The light shielding film according to Claim 18, said barrier layers being formed on both surfaces of said metal layer into a multilayer structure.

5 28. The light shielding film according to Claim 18, said metal layer including a light-reflective metal layer and a light-absorbable metal layer.

29. The light shielding film according to Claim 28, said light-absorbable metal layer being formed of a nitride compound.

10 30. The light shielding film according to Claim 28, said metal layer including a light-shielding metal layer and light-absorbable metal layers disposed on two respective opposing surfaces of said light-shielding metal layer.

31. A light shielding film, comprising:

a metal layer formed of a refractory metal in the form of a simple substance or a refractory metal compound; and

15 a barrier layer formed of a refractory metal or a refractory metal compound which is disposed on at least one surface of said metal layer so as to protect said metal layer from oxidation.